



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

VOL. V. SAN FRANCISCO, CALIFORNIA, JANUARY 1, 1893. No. 27.

OFFICERS OF THE SOCIETY.

OFFICERS OF THE CHICAGO SECTION.

Executive Committee—Messrs. DOUGLASS (Chairman), EWELL, PIKE, THWING.

CARL H. ABBOTT	118 11th St., Oakland, Cal.
A. E. ADAMS	{ 4020 Drexel Boulevard, Chicago, Ill.
THEODORE ADAMS	{ 833 N. Broad St., Philadelphia, Penn.
Prof. W. STEADMAN ALDIS*.	{ University College, Auckland, New Zealand.
A. B. ALEXANDER	404 Post St., S. F., Cal.
Prof. W. D. ALEXANDER	Honolulu, Hawaiian Islands.
H. A. ALLEN	{ 396 Kenilworth Place, Milwaukee, Wis.

* A star signifies Life-Membership. Addresses in italics are not within the Postal Union. Total membership, 493 (55 life-members).

Publications of the

Prof. IRA W. ALLEN	2251 Calumet Ave., Chicago, Ill.
RICHARD H. ALLEN*	Chatham, Morris Co., N. J.
ELMER L. ALLOR	Observatory, Ann Arbor, Mich.
CHARLES ALTSCHUL	{ London, Paris and American Bank, S. F., Cal.
Hon. HENRY B. ALVORD*	San José, Cal.
Hon. WILLIAM ALVORD*	2200 Broadway, S. F., Cal.
Mrs. WILLIAM ALVORD*	2200 Broadway, S. F., Cal.
W. S. ANDREWS	{ Edison Building, Broad St., New York City.
Director ANGEL ANGUIANO	{ National Observatory, Tacu- baya, Mexico.
E. M. ANTONIADI	Constantinople, Turkey.
DANIEL APPEL	{ 62 Holyoke Place, Cleveland, Ohio.
AGUSTIN ARAGÓN	{ Puerta falsa de la Merced No. 3, City of Mexico, Mexico.
F. S. ARCHENHOLD	{ Observatorium, Grunewald, bei Berlin, Germany.
Mrs. H. R. ARNDT	San Diego, Cal.
Dr. HARRIET AUCUTT	726 23d St., Ogden, Utah.
WILLIAM W. AUSTIN	{ Vineland, Cumberland Co., New Jersey.
ROBERT STANTON AVERY	320 A Street, Washington, D. C.
T. W. BACKHOUSE	{ West Hendon House, Sunder- land, England.
CHAS. A. BACON	{ Director Smith Observatory, Beloit, Wis.
H. D. BACON*	960 Oak St., Oakland, Cal.
N. Y. BAILEY	Early Grove, Mississippi.
R. D. BAKER	356 E. 22d St., E. Oakland, Cal.
T. R. BANNERMAN	2407 Howard St., S. F., Cal.
DR. G. BARROETA	San Luis Potosi, Mexico.
J. BASSETT	{ 82 High St., Stoke Newington, N. England.
Mrs. CAROLINE R. BEALS	Berkeley, Cal.
Hon. JOHN L. BEARD	{ Warm Springs, Alameda Coun- ty, Cal.
GEORGE W. BEAVER	1300 Taylor St., S. F., Cal.
A. C. BEHR	16 Union Place, Chicago, Ill.
D. P. BELKNAP	405 Montgomery St., S. F., Cal.
HENRY BERGER	{ Observatory Hill, Allegheny, Penn.
EDWIN BERGH	429 5th Ave., New York, N. Y.
Prof. FRANK H. BIGELOW	{ U. S. Weather Bureau, Wash- ington, D. C.
R. L. BISCHOFFSHEIM*	3 Rue Taitbout, Paris, France.
ANSON STILES BLAKE	Berkeley, Cal.
CHARLES T. BLAKE	Berkeley, Cal.
Hon. JOHN H. BOALT	332 Haight St., S. F., Cal.
C. O. BORING	{ Care J. V. Farwell & Co., Chi- cago, Ill.

HENRY LORD BOULTON, JR*	{ Carácas, Venezuela, or Box 2015, New York City.
HENRY BOURSIN	Douglas City, Alaska.
FRANCIS BRADLEY	Evanston, Ill.
J. A. BRASHEAR	Allegheny City, Penn.
Rev. M. S. BRENNAN	{ St. Lawrence's Church, St. Louis, Mo.
Rev. A. L. BREWER	San Mateo, Cal.
Mrs. RUTH W. BREWSTER	{ 145 Oakwood Boulevard, Chi- cago, Ill.
JOSEPH BROOKS	{ Hope Bank, Nelson St., Wool- lahra, via Sydney, New South Wales.
Miss E. BROWN*	{ Further Barton, Cirencester, England.
WILLIAM ANDREWS BROWNE, M. D. . .	Newton, Mass.
J. L. BROWNELL	Nyack, New York.
Dr. J. D. BROWNLEE	754 S. 3d St., San José, Cal.
Miss C. W. BRUCE*	39 E. 23d St., New York City.
CHARLES BURCKHALTER, F. R. A. S. .	{ Chabot Observatory, Oakland, Cal.
D. H. BURNHAM	Rookery Building, Chicago, Ill.
Miss HARRIETTA C. BUTLER	1909 Pine St., S. F., Cal.
Miss MARY E. BYRD	{ The Observatory, Smith Col- lege, Northampton, Mass.
Dr. J. CALLANDREAU*	406 Montgomery St., S. F., Cal.
A. CAMERON	Yarmouth, Nova Scotia.
W. W. CAMPBELL	{ Lick Observatory, Mt. Hamil- ton, Cal.
H. P. CARLTON	716 19th St., Oakland, Cal.
ANDREW CARNEGIE*	5 West 51st St., New York City.
O. E. CARTWRIGHT	{ 165 Elmwood Ave., Detroit, Mich.
CLARENCE CARY	{ 59 Wall St., New York City, N. Y.
F. J. CASTELHUN	320 Sansome St., S. F., Cal.
J. C. CEBRIAN*	{ Pine and Octavia Sts., S. F., Cal.
Mrs. EMELIE M. CHABOT	{ Cor. 11th and Madison Sts., Oakland, Cal.
Miss JOSIE CHABOT	{ Cor. 11th and Madison Sts., Oakland, Cal.
FREDERICK H. CHAPIN	Hartford, Conn.
E. K. CHAPMAN	315 Montgomery St., S. F., Cal.
Mrs. JOHN JAY CHAPMAN	{ 327 W. 82d St., New York, N. Y.
Rev. C. M. CHARROPPIN, S. J. . . .	St. Charles, Mo.
ISAAC Y. CHUBBUCK	Roxbury, Mass.
A. R. CHURCH	1102 10th St., Oakland, Cal.
Rev. E. BENTLEY CHURCH	1036 Valencia St., S. F., Cal.
B. G. CLAPP	The Academy, Fulton, N. Y.
Dr. E. S. CLARK	16 Geary St., S. F., Cal.

MATEO CLARK*	{ 27 Queen's Gate, London, Eng- land.
Miss AGNES M. CLERKE	{ 68 Redcliffe Square, London, England.
C. H. COCHRANE	{ 18 Astor Place, New York, N. Y.
Prof. C. S. COOK	Keene, N. H.
Mrs. E. E. COOK	220 Main St., Davenport, Iowa.
Dr. GEORGE W. COOK	131 53d St., Chicago, Ill.
THE COSMOS CLUB	Washington, D. C.
J. COSTA	406 Montgomery St., S. F., Cal.
CHARLES A. CRACKBON	300 Scott St., S. F., Cal.
A. W. CRAIG	177 8th St., Oakland, Cal.
HOMER A. CRAIG	1325 Alice St., Oakland, Cal.
Hon. C. F. CROCKER*	{ Leavenworth and Pine Sts., S. F., Cal.
CHAS. H. CROCKER	{ Care H. S. Crocker Co., S. F., Cal.
Miss S. J. CUNNINGHAM	{ Swarthmore College, Delaware Co., Penn.
CHAS. S. CUSHING	1669 13th St., Oakland, Cal.
J. EWEN DAVIDSON*	{ Alexandra Plantation, Brans- combe, Mackay, Queensland.
Dr. J. H. DE MERITT	{ 1335 Vermont Ave., Washing- ton, D. C.
Col. E. A. DENICKE	{ Room 4, 320 Sansome St., S. F., Cal.
A. B. DEPUY	{ 541 Washington St., Camden, N. J.
W. H. DEVINE	Nagasaki, Japan.
FRANK H. DICKEY	3626 Ellis Ave., Chicago, Ill.
F. W. DOHRMANN	Alameda, Cal.
JOHN DOLBEER	10 California St., S. F., Cal.
Hon. JOSEPH A. DONOHUE*	Menlo Park, Cal.
Miss JEANNETTE DOUGHERTY	410 Ellis St., S. F.
GAYTON A. DOUGLASS	185 Wabash Ave., Chicago, Ill.
W. E. DOWNS	Sutter Creek, Amador Co., Cal.
Prof. MELVILLE DOZIER	{ State Normal School, Los An- geles, Cal.
Mrs. ANNA PALMER DRAPER*	{ 271 Madison Ave., New York City.
Dr. L. L. DUNBAR	500 Sutter St., S. F., Cal.
Miss DUNHAM	37 E. 36th St., New York, N. Y.
FRANCIS G. DU PONT	Wilmington, Del.
Mrs. HERBERT DU PUY	{ 190 Western Ave., Allegheny, Penn.
Hon. J. DIAZ DURAN	204 Front St., S. F., Cal.
HARRY DURBROW	322 California St., S. F., Cal.
EARNEST I. DYER	{ University of California, Berke- ley, Cal.
JOSEPH G. EASTLAND	920 Pine St., S. F., Cal.

CHARLES R. EASTMAN	{	Care Alvan Clark, 186 Brook- line St., Cambridge, Mass.
Mrs. CHARLES R. EASTMAN	{	Care Alvan Clark, 186 Brook- line St., Cambridge, Mass.
ALFRED L. EDWARDS		12 W. 33d St., New York City.
Prof. GEORGE C. EDWARDS		Berkeley, Cal.
W. S. EICHELBERGER	{	Wesleyan University, Middle- town, Conn.
Capt. OLIVER ELDRIDGE		615 Sutter St., S. F., Cal.
THOMAS GWYN ELGER	{	Beaumont House, Shakespeare Road, Bedford, England.
FERD. ELLERMAN	{	5729 Kimbark Ave., Chicago, Ill.
R. L. J. ELLERY	{	Govt. Astronomer, Observatory, Melbourne, Victoria.
J. J. EVANS		406 California St., S. F., Cal.
Dr. M. D. EWELL		97 Clark St., Chicago, Ill.
Mrs. MARTHA MCC. EWER		1513 Clay St., S. F., Cal.
WARREN B. EWER		1513 Clay St., S. F., Cal.
Hon. JAMES G. FAIR*		230 Montgomery St., S. F., Cal.
FRANKLIN FAIRBANKS		St. Johnsbury, Vermont.
H. W. FAUST		618 Harrison St., S. F., Cal.
W. B. FEATHERSTONE		2116 Bush St., S. F., Cal.
F. H. FERRINGTON		36 Albert St., Shrewsbury, Eng.
Mrs. J. A. FILLMORE		Occidental Hotel, S. F., Cal.
ROBERT ISAAC FINNEMORE,* F. R. A. S.		<i>Durban, Natal, South Africa.</i>
S. WILSON FISHER		1502 Pine St., Philadelphia, Pa.
W. C. FITZSIMMONS		517 Mason St., S. F., Cal.
ANDREW B. FORBES*		401 California St., S. F., Cal.
GEORGE STUART FORBES		Madras, India.
ARTHUR W. FOSTER*		322 Pine St., S. F., Cal.
M. P. FREEMAN	{	President University of Arizona, Tucson, Arizona.
H. C. FRICK*		42 5th Ave., Pittsburg, Penn.
Prof. CHAS. W. FRIEND		Observatory, Carson, Nev.
ROBERT D. FRY*		1812 Jackson St., S. F., Cal.
Dr. C. G. FULLER	{	39 Central Music Hall, Chicago, Ill.
Hon. LEVI K. FULLER		Brattleboro', Vermont.
Hon. W. H. GALBRAITH		Santa Cruz, Cal.
JOHN GAMBLE		Haywards, Cal.
OTTO VON GELDERN	{	Room 56, 819 Market St., S. F., Cal.
Prof. T. C. GEORGE		1316 10th St., Sacramento, Cal.
LOUIS GEX		Santos, Brazil.
Gen. JOHN GIBBON, U. S. A.	{	Headquarters, Military Div. Pa- cific, S. F., Cal.
J. J. GILBERT		Olympia, Washington.
Dr. DAVID GILL	{	<i>Royal Astronomer, Cape of Good Hope, Africa.</i>
ALLEN F. GILLIHAN		135 Pandora St., Victoria, B. C.

Publications of the

L. GILSON	211 Sansome St., S. F., Cal.
GEORGE GLEASON	{ South Pasadena, Los Angeles Co., Cal.
CAMILO GONZALES	{ National Observatory, Tacu- baya, Mexico.
Capt. CHARLES GOODALL*	{ S. E. cor. McAllister and Pierce Sts., S. F., Cal.
ADAM GRANT*	{ N. E. cor. Bush and Sansome Sts., S. F., Cal.
JOSEPH D. GRANT*	{ N. E. cor. Bush and Sansome Sts., S. F., Cal.
CHARLES GRAVES	Divinity Hall, Meadville, Penn.
Prof. D. GRAWE	{ Observatory, University of St. Petersburg, St. Petersburg, Russia.
T. P. GRAY	{ The Lodge, Clapham Road, Bedford, England.
ANDREW GREIG*	Belle Vue, Tayport, Scotland.
Sir GEORGE GREY, K. C. B.*	Auckland, New Zealand.
C. P. GRIMWOOD	P. O. Box 2092, S. F., Cal.
ALVA J. GROVER	1137 Park Ave., Omaha, Neb.
H. GRATTAN GUINNESS, D. D.	{ Cliff House, Curbar, via Shef- field, England.
Miss ESTELLA L. GUPPY	San José, Cal.
W. C. GURLEY	Marietta, Ohio.
E. F. HAAS	Berkeley, Cal.
STEPHEN M. HADLEY	Penn College, Oskaloosa, Iowa.
G. E. HALE	{ 4545 Drexel Boulevard, Chica- go, Ill.
W. E. HALE	{ 4545 Drexel Boulevard, Chica- go, Ill.
Prof. R. LEE HAMON	Hyannis, Grant Co., Neb.
DANIEL HANLON	1627 Jackson St., S. F., Cal.
Miss JOSEPHINE HARKER	1909 Pine St., S. F., Cal.
Dr. H. W. HARKNESS	{ California Academy of Sci- ences, S. F., Cal.
WM. STURTEVANT HARLOW	Oakland, Cal.
ORRIN E. HARMON	Chehalis, Lewis Co., Wash.
Miss EDITH H. HARRISON	1947 Welton St., Denver, Colo.
HENRY HARRISON	{ Maudeville Ave., Jersey City Heights, New Jersey.
H. BARRYMORE HARRISON	{ Persian Gulf Telegraph, Kara- chi, via Bombay, India.
CHARLES F. HART	{ The Oaks, North Temescal, Alameda Co., Cal.
Prof. MELLEN W. HASKELL	{ University of California, Berke- ley, Cal.
O. C. HASTINGS	Box 166, Victoria, B. C.
F. H. HAUSMAN	P. O. Box 2468, S. F., Cal.
Judge C. M. HAWLEY	{ 5326 Washington Ave., Chicago, Ill.
Rev. HENRY C. HAWTREY	{ Greycliff, Bonchurch, Isle of Wight, England.

Mrs. PHEBE HEARST	California Hotel, S. F., Cal.
JOHN P. HELY, C. E.	Cairo, Ill.
N. H. HEMIUP	{ 604 5th St., S. E., Minneapolis, Minn.
H. S. HERRICK	13 Nevada Block, S. F., Cal.
WILLIAM E. HESS	519 Kearny St., S. F., Cal.
DAVID HEWES	Occidental Hotel, S. F., Cal.
GEORGE W. HEWITT	Burlington, New Jersey.
Prof. ALFRED HIGBIE	{ S. W. cor. Pierce and Pine Sts., S. F., Cal.
Hon. HENRY E. HIGHTON	528 California St., S. F., Cal.
Hon. S. G. HILBORN	401 California St., S. F., Cal.
CHAS. B. HILL	213 Sansome St., S. F., Cal.
HORACE L. HILL*	314 California St., S. F., Cal.
Dr. A. C. HIRST	{ Simpson Memorial Church, S. F., Cal.
GEO. N. HITCHCOCK	San Diego, Cal.
Rev. H. O. HOFFMAN	Bloomington, Ill.
SAMUEL V. HOFFMAN*	{ Johns Hopkins University, Bal- timore, Md.
CHARLES W. HOLDEN	30 Congress St., Boston, Mass.
EDWARD S. HOLDEN	{ Lick Observatory, Mt. Hamil- ton, Cal.
S. E. HOLDEN	Napa, Cal.
L. J. HOLTON	1207 Grand St., Alameda, Cal.
MAURES HORNER	{ 12 St. Helen's Place, Bishops- gate St., London, E. C., Eng.
WILLIAM HOSKINS	Lagrange, Cook Co., Ill.
Prof. G. W. HOUGH	{ Dearborn Observatory, Evans- ton, Ill.
Hon. C. WEBB HOWARD*	Pacific Union Club, S. F., Cal.
JOHN L. HOWARD	132 Market St., S. F., Cal.
WM. HOWAT	{ 358 William St., Melbourne, Victoria.
HUGH HOWELL	2158 West St., Oakland, Cal.
Prof. C. H. HOWIESON	Chippewa Falls, Wis.
HENRY S. HULBERT	Probate Court, Detroit, Mich.
Prof. ALEX. S. HUNTER	Hanover, Indiana.
W. J. HUSSEY	{ Stanford Jr. University, Palo Alto, Cal.
IMPERIAL OBSERVATORY	{ University of St. Petersburg, Russia.
JAMES E. INGRAHAM	{ Pres. S. F. R. R. Co., Sanford, Fla.
C. W. IRISH	Reno, Nev.
HERMANN IWERSSEN	{ Consul for Sweden and Norway, Nagasaki, Japan.
W. H. IZZARD	{ 20 Boston Park Road, Brent- ford, W. England.
Miss CAROLINE C. JACKSON	1379 8th Ave., E. Oakland, Cal.
CHARLES H. JACKSON	517 Mason St., S. F., Cal.

Publications of the

FRANK JAYNES	W. U. Telegraph Co., S. F., Cal.
NELS JOHNSON.	Manistee, Mich.
T. C. JOHNSTON.	27 Market St., S. F., Cal.
Prof. C. N. JONES	{ Care New York Life Ins. Co., 346 Broadway, New York.
E. B. JORDAN	581 Market St., S. F., Cal.
Hon. W. H. JORDAN	328 Montgomery St., S. F., Cal.
CHRISTIE C. KANAGA	Box 158, Ogden, Utah.
Miss FLORENCE BAYARD KANE	Chestnut Hill, Philadelphia, Pa.
Prof. J. E. KEELER	{ The Observatory, Allegheny City, Pa.
Prof. JOSIAH KEEP.	Mills College, Alameda Co., Cal.
A. KEITH.	Riverside, Cal.
W. E. KEITH.	Riverside, Cal.
HENRY A. KELLER	San Bernardino, Cal.
A. E. KENNELLY	Edison Laboratory, Orange, N. J.
Prof. JEFFERSON E. KERSCHNER . . .	{ Daniel Scholl Observatory, Lan- caster, Penn.
RODNEY G. KIMBALL	253 Monroe St., Brooklyn, N. Y.
Miss LAURA KIMBER.	Hotel Richelieu, S. F., Cal.
DONALD KING	{ 8 Church Lane, Hornsey, Lon- don, England.
Prof. D. KIRKWOOD, LL. D.	Arlington Ave., Riverside, Cal.
SYDNEY T. KLEIN*	{ Stanmore Observatory, Great Stanmore, Middlesex, England.
Miss DOROTHEA KLUMPKE	{ National Observatory, Paris, France.
WM. H. KNIGHT	{ 747 College St., Los Angeles, Cal.
EDWARD B. KNOBEL	Bocking, Braintree, England.
AUGUSTUS F. KNUDSEN	Box 2139, Boston, Mass.
TORVALD KÖHL*	Odder, Denmark.
FR. KOEPPEN	{ Potsdamer St. 65, Berlin, Ger- many.
C. F. DE LANDERO	Box 34, Guadalajara, Mexico.
Miss LASSELL	{ Winkton Lodge, near Ring- wood, Hants, England.
JOSEPH G. LAVERY	219 Sansome St., S. F., Cal.
WALTER W. LAW	Yonkers, N. Y.
Miss HANNAH TOWNSEND LAWRENCE	{ Bayside, Long Island, New York.
Prof. ANDREW COWPER LAWSON . . .	Berkeley, Cal.
Prof. JOSEPH LE CONTE, LL. D. . . .	Berkeley, Cal.
Rev. EDMUND LEDGER, M. A., F. R. A. S.	Claydon, Ipswich, England.
Dr. L. L. LEGGETT	{ Masonic Temple, Cleveland, Ohio.
Miss MARGARET LEPPER	Box 490, Benicia, Cal.
A. O. LEUSCHNER	{ University of California, Berke- ley, Cal.
Miss EMMA LEWIS	{ Care Allen & Lewis, Portland, Oregon.

J. B. LEWIS, C. E.	126 Sparks St., Ottawa, Canada.
JOHN E. LEWIS	Ansonia, Conn.
Dr. W. B. LEWITT	{ Hayes and Laguna Sts., S. F., Cal.
THE CITY LIBRARY	Lowell, Mass.
THE NEWBERRY LIBRARY	Chicago, Ill.
ADOLPH LIETZ	422 Sacramento St., S. F., Cal.
J. A. LIGHTHIPE	112 Bush St., S. F., Cal.
Prof. LOUIS LISSER	1241 Franklin St., S. F., Cal.
JOHN D. LOCKE	Pomona, Cal.
HENRY B. LOOMIS	Seattle, Washington.
CHAS. LOUGHRIDGE	{ Chamber of Commerce Build- ing, Chicago, Ill.
CHARLES A. LOXTON	Walsall, Staffordshire, England.
Prof. GUSTAV C. LUEBEN	San Rafael, Marin Co., Cal.
FRANK E. LUNT	{ Care R. G. Lunt, Los Angeles, Cal.
H. C. LYON	1534 Mission St., S. F., Cal.
Rev. ROBT. MACKENZIE, D. D.	San Francisco, Cal.
ROGER D. MAGEE	20 Montgomery St., S. F., Cal.
DAVID MAHANY	{ 13 East 55th St., New York City.
MARSDEN MANSON	10 California St., S. F., Cal.
F. MARTENS	{ College Point, Queen's Co., New York.
CAMILO MARTIN	411½ California St., S. F., Cal.
HON. E. S. MARTIN	P. O. Box 75, Wilmington, N. C.
HON. E. B. MASTICK	{ Office of the Lick Trust, S. F., Cal.
CHARLES MATSON	{ Box 30, Edison, Skagit Co., Washington.
W. H. MAW*	{ 18 Addison Road, Kensington, London, England.
FRANK McCLEAN,* M. A., F. R. A. S.	{ Rusthall House, Tunbridge Wells, England.
S. S. McCLURE	{ Tribune Building, New York City.
JAMES JENNINGS McCOMB	{ 175 W. 58th St., New York City.
F. H. McCONNELL	19 Montgomery St., S. F., Cal.
JOHN McDONOUGH	193 28th St., Brooklyn, N. Y.
PETER McEWEN	819 Market St., S. F., Cal.
FRANK McMULLEN	Grangers' Bank, S. F., Cal.
Prof. MALCOLM McNEILL	Lake Forest, Ill.
ARTHUR MEE, F. R. A. S.	"Western Mail," Cardiff, Eng.
J. MESSER	{ Care of Carl Ricker, Nevsky Prospect, No. 14, St. Peters- burg, Russia.
Prof. A. A. MICHELSON	{ University of Chicago, Chicago, Ill.
HON. ALBERT MILLER*	532 California St., S. F., Cal.

Publications of the

DAVID MILLER	{ Lands Department, Sydney, New South Wales.
Prof. E. MILLER	{ University of Kansas, Law- rence, Kansas.
Miss G. J. MILLER . . . . .	. 307 17th St., Portland, Oregon.
MILO H. MILLER	{ McKeesport, Allegheny Co., Penn.
Hon. D. O. MILLS* . . . . .	. 15 Broad St., New York City.
Judge F. W. MINER . . . . .	. Providence, R. I.
E. J. MOLERA . . . . .	. 850 Van Ness Ave., S. F., Cal.
W. H. S. MONCK	{ 16 Earlsfort Terrace, Dublin, Ireland.
Hon. ALEXANDER MONTGOMERY* . .	{ Leavenworth and Vallejo Sts., S. F., Cal.
Mrs. ALEXANDER MONTGOMERY* . .	{ Leavenworth and Vallejo Sts., S. F., Cal.
BEVERLY K. MOORE . . . . .	. 56 Bedford St., Boston, Mass.
JAMES MOORE . . . . .	. 310 California St., S. F., Cal.
Prof. IRA MORE	{ Normal School, Los Angeles, Cal.
C. MOORMAN . . . . .	. What Cheer, Keokuk Co., Iowa.
FREMONT MORSE, U. S. C. & G. Survey	. P. O. Box 2512, S. F., Cal.
WM. S. MOSES	{ Turk St., bet. Masonic and Parker Aves., S. F., Cal.
C. A. MURDOCK . . . . .	. 826 Green St., S. F., Cal.
Hon. B. D. MURPHY* . . . . .	. San José, Cal.
H. F. NEWALL,* F. R. A. S.	{ Observatory of the University, Cambridge, England.
C. J. NICKERSON . . . . .	. St. Helena, Napa Co., Cal.
G. W. NICOLLS . . . . .	. Caixa 776, Rio de Janeiro, Brazil.
P. NOORDHOFF . . . . .	. Groeningen, Holland.
CHARLES NORDHOFF . . . . .	. Coronado, Cal.
Hon. WILLIAM NORRIS . . . . .	. 927 Bush St., S. F., Cal.
Miss ROSE O'HALLORAN . . . . .	. 2209 Fillmore St., S. F., Cal.
WARREN OLNEY . . . . .	. 481 Prospect Ave., Oakland, Cal.
Miss M. A. ORR . . . . .	. Beverley, Armidale, N. S. W.
F. S. OSBORNE . . . . .	. Montauk Block, Chicago, Ill.
M. M. O'SHAUGHNESSY . . . . .	. 2010 Eddy St., S. F., Cal.
OXFORD COLLEGE . . . . .	. Oxford, Ohio.
OLIVER E. PAGIN	{ Room 40, U. S. Custom House, Chicago, Ill.
T. S. PALMER	{ Department of Agriculture, Washington, D. C.
Dr. GEORGE C. PARDEE . . . . .	. 526 Montgomery St., S. F., Cal.
JAMES L. PARK . . . . .	. Braddock, Pa.
H. E. PARKER	{ 57 Railroad Ave., E. E., Bridge- port, Conn.
JOHN A. PARKHURST . . . . .	. Marengo, McHenry Co., Ill.
JOHN PARTRIDGE . . . . .	. 214 California St., S. F., Cal.
Dr. S. C. PASSAVANT . . . . .	. Powers Hotel, Rochester, N. Y.
JOHN PATTEN	{ Harford Ave. and Forrest St., Baltimore, Md.

Miss ELIZABETH H. PEARSON	{ 219 Savin Hill Ave., Boston, Mass.
Miss CLARA A. PEASE	High School, Hartford, Conn.
Miss PENDLETON	1522 Locust St., Philadelphia, Pa.
Hon. GEO. C. PERKINS*	Oakland, Cal.
Prof. H. B. PERKINS	{ University of Southern California, Los Angeles, Cal.
C. D. PERRINE	211 Clay St., S. F., Cal.
JOHN PERRY, JR.	Occidental Hotel, S. F., Cal.
ALANSON H. PHELPS	220 Mission St., S. F., Cal.
Hon. T. GUY PHELPS	Belmont, Cal.
HENRY PHIPPS, JR.*	{ Carnagie, Phipps & Co., Pitts- burg, Penn.
ARCHIE B. PIERCE	{ University of California, Berke- ley, Cal.
LAWRENCE H. PIERSON	Pacific P. L. Co., S. F., Cal.
Hon. WM. M. PIERSON, F. R. A. S.	{ 4th floor, Mills Building, S. F., Cal.
O. A. L. PIHL	Christiania, Norway.
RUTHVEN W. PIKE*	166 La Salle St., Chicago, Ill.
CHARLES LANE POOR	{ Johns Hopkins University, Bal- timore, Md.
THOMAS PORTER	Lauriston, Ballarat, Australia.
CHARLES A. POST	Bayport, Long Island, N. Y.
THOMAS PRATHER	{ President Union Savings Bank, Oakland, Cal.
MANUEL G. PRIETO	Tacubaya, Mexico.
Prof. H. S. PRITCHETT	{ Observatory of Washington University, St. Louis, Mo.
C. PUDDFOOT	{ Champlain and Brush Sts., De- troit, Mich.
EDWARD THOMAS PURSER	Healdsburg, Cal.
FEODORO QUINTANO	{ National Observatory, Tacu- baya, Mexico.
Miss GRACE RAND	Lombard, Illinois.
A. COWPER RANYARD*	{ 11 Stone Buildings, Lincoln's Inn, London, England.
ALBERT RAYMOND	{ Room 96, Chronicle Building, S. F., Cal.
WM. G. RAYMOND	Berkeley, Cal.
NORMAN B. REAM	1901 Prairie Ave., Chicago, Ill.
ALFRED P. REDINGTON	{ Second and Stevenson Sts., S.F. Cal.
Prof. J. K. REES	{ Observatory of Columbia Col- lege, New York City.
EDWARD B. REILLEY	{ 1812 Christian St., Philadelphia, Penn.
M. REIMAN	{ 4325 Drexel Boulevard, Chica- go, Ill.
FRANCISCO RODRIGUEZ REY	{ National Observatory, Tacu- baya, Mexico.
V. J. A. REY	829 Union St., S. F., Cal.

MELVILLE SMITH	24 Winthrop St., Augusta, Me.
WM. F. SMITH	2426 Pine St., S. F., Cal.
SAMUEL SONNENFELD	331 Kearny St., S. F.
Prof. F. SOULÉ	Observatory, Berkeley, Cal.
ROGER SPRAGUE	Napa College, Napa, Cal.
Dr. HEZEKIAH STARR	{ 218 N. Liberty St., Baltimore, Md.
J. F. STEWARD	1135 Dunning St., Chicago, Ill.
Rev. GEORGE STOKES	{ St. John's Vicarage, Isleworth, Middlesex, England.
President C. C. STRATTON	{ Willamette University, Salem, Oregon.
Prof. W. H. VON STREERUWITZ	P. O. Box 465, Austin, Texas.
Prof. I. STRINGHAM, Ph. D.	Berkeley, Cal.
S. H. STRITE	316 Sacramento St., S. F., Cal.
HON. DEMAS STRONG	71 Broadway, Brooklyn, N. Y.
GEORGE H. STRONG	220 Market St., S. F., Cal.
Miss HENRIETTA STRONG	{ "The Virginia," Rush St., Chi- cago, Ill.
Mrs. WILLIAM EMERSON STRONG	{ "The Virginia," Rush St., Chi- cago, Ill.
Dr. M. J. SULLIVAN	30 Post St., S. F., Cal.
W. T. SULZER	Louisville, Ky.
HON. A. SUTRO*.	{ 30 Montgomery Block, S. F., Cal.
H. C. SWAIN	1107 Post St., S. F., Cal.
Prof. WM. SYMONDS	Santa Rosa, Cal.
HARRY W. SYZ	410 California St., S. F., Cal.
Miss ABBY TAFT	Box 45, College Park, Cal.
C. F. A. TALBOT	204 California St., S. F., Cal.
C. L. TAYLOR	709 Bush St., S. F., Cal.
Prof. J. M. TAYLOR	State University, Seattle, Wash.
Dr. JESÚS MUÑOZ TÉBAR	Carácas, Venezuela, S. A.
JOHN TEBBUTT	{ Observatory, Windsor, New South Wales.
I. E. THAYER	204 Front St., S. F., Cal.
Dr. JOHN M. THOME*	{ National Observatory, Cordo- ba, Argentine Republic.
Prof. C. B. THWING	{ Northwestern University, Evans- ton, Ill.
C. W. TIEDEMANN	312 6th St., S. F., Cal.
RICHARD M. TOBIN	Hibernia Bank, S. F., Cal.
FREDERICK C. TORREY	108 Grant Ave., S. F., Cal.
HON. J. W. TOWNER	Santa Ana, Orange Co., Cal.
S. D. TOWNLEY	{ University of California, Berke- ley, Cal.
J. P. TREANOR	320 Sansome St., S. F., Cal.
Prof. C. W. TREAT	Observatory, Napa, Cal.
HON. ALFRED L. TUBBS*	611 Front St., S. F., Cal.
HENRY J. TURNER*	{ Woodville, Rappahannock Co., Va.

Publications of the

Miss M. J. TURNER	11 Faxon Ave., Quincy, Mass.
Prof. L. W. UNDERWOOD	{ Underwood Observatory, Appleton, Wisconsin.
Miss SARA CARR UPTON	{ 2109 Pennsylvania Ave., Washington, D. C.
Señor FRANCISCO VALIENTE	San José, Costa Rica.
FELIPE VALLE	{ National Observatory, Tacubaya, Mexico.
J. M. VAN SLYKE	{ 29 S. Pinckney St., Madison, Wis.
M. A. VEEDER, M. D.	Lyons, New York.
P. V. VEEDER, D. D.	Berkeley, Cal.
RUDOLPH E. VOIGT	207 California St., S. F., Cal.
Rev. JACOB VOORSANGER	2316 California St., S. F., Cal.
JOSEPH B. WALKER	{ Sampson & Hendricks Building, Austin, Texas.
W. R. WARNER	{ Care of Warner & Swasey, East Prospect St., Cleveland, Ohio.
Prof. L. WEINEK	{ Imperial Observatory, Prague, Austro-Hungary.
Prof. L. G. WELD	{ State University, Iowa City, Iowa.
President ANDREW D. WHITE*	Ithaca, N. Y.
E. J. WHITE	{ Observatory, Melbourne, Victoria.
FREDERICK H. WHITWORTH	Seattle, Wash.
A. STANLEY WILLIAMS	{ Bella Vista, Hove Park Villas, West Brighton, England.
Rev. E. F. WILLIAMS, D. D.	{ 4545 Drexel Boulevard, Chicago, Ill.
Mrs. MARY H. WILLMARTH*	222 Michigan Ave., Chicago, Ill.
JAMES A. WILSON	1321 Steiner St., S. F., Cal.
J. HOWARD WILSON	753 Carroll St., Brooklyn, N. Y.
Miss MARY E. WILSON	{ 328 Boulevard Terrace, Oakland, Cal.
WILLIAM C. WINLOCK	{ Smithsonian Institution, Washington, D. C.
Colonel B. WITKOVSKY*	{ St. Petersburg, Petersburg Side, Great Prospect h. 8, l. 5, Russia.
Mrs. RICHARD WOOD	243 Ridge Ave., Allegheny, Pa.
Mrs. HARRIET F. WRIGHT	1111 Corona St., Denver, Colo.
Rev. J. H. WYTHE, D. D.	825 14th St., Oakland, Cal.
CHAS. G. YALE	220 Market St., S. F., Cal.
JOHN H. YOELL	San José, Cal.
EDWARD B. YOUNG	430 Montgomery St., S. F., Cal.
TULLY T. YOUNG	702 Powell St., S. F., Cal.
FREDERICK W. ZEILE*	308 Market St., S. F., Cal.
Prof. C. V. ZENGER	Smichow, Prague, Bohemia.
F. R. ZIEL	410 California St., S. F., Cal.